

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A power supply apparatus, comprising:

a plurality of power source circuits with a common direct current power source;

an oscillator circuit which generates ~~a plurality of~~ a common oscillator ~~signals~~ signal; and

a controller which performs a time sharing control based on the ~~plurality~~ of oscillator ~~signals~~ signal to enable the plurality of power source circuits to receive power from the common direct current power source in different timings and to output respective voltages.

2. (Original) The power supply apparatus according to claim 1,

wherein the respective voltages are different from each other.

3. (Currently Amended) The power supply apparatus according to claim 2, further comprising:

a selection circuit, selecting at least two power source circuits out of the plurality of power source circuits,

wherein the controller performs the time sharing control to enable the selected at least two power source circuits to receive power from the common direct current power source based on the ~~plurality of oscillator signals~~ signal.

4. (Currently Amended) The power supply apparatus according to claim 3,

wherein the plurality of power source circuits include a voltage-step-up circuit, a voltage-step-down circuit, and a multiplicative voltage-step-up circuit, wherein

the selection circuit selects one of a combination of the voltage-step-up and voltage-step-down circuits and the voltage-step-down and multiplicative voltage-step-up circuits, and wherein

the controller performs the time sharing control based on the ~~plurality of oscillator signals~~ signal to enable one of the combination of the voltage-step-up

and voltage-step-down circuits and the voltage-step-down and multiplicative voltage-step-up circuits selected by the selection circuit to receive power from the common direct current power source, and

wherein the voltage step-down circuit receives power from the common direct current power source with a substantially identical timing when either one of the combinations is selected.

5. (Currently Amended) A power supply apparatus, comprising:

a plurality of power generating means for generating a plurality of different output powers based on a common direct current power source;

oscillating means for generating ~~a plurality of a common~~ oscillator signals signal; and

controlling means for performing a time sharing control based on the ~~plurality of oscillator signals~~ signal to enable the plurality of power generating means to receive power from the common direct current power source in different timings and to output respective voltages.

6. (Original) The power supply apparatus according to claim 5,

wherein the respective voltages are different from each other.

7. (Currently Amended) The power supply apparatus according to claim 6,
further comprising:

selecting means for selecting at least two power generating means out of
the plurality of power generating means,

wherein the controlling means performs the time sharing control to enable
the selected at least two power generating means to receive power from the
common direct current power source based on the ~~plurality of oscillator~~
~~signals~~ signal.

8. (Currently Amended) The power supply apparatus according to claim 7,

wherein the plurality of power generating means include voltage-step-up
means for generating a step-up voltage, voltage-step-down means for generating

a step-down voltage, and multiplicative voltage-step-up means for generating a multiplicative step-up voltage, wherein

the selecting means selects one of a combination of the voltage-step-up and voltage-step-down means, and the voltage-step-down and multiplicative voltage-step-up means, and wherein

the controlling means performs the time sharing control based on the ~~plurality of oscillator signals~~ signal to enable one of the combination of the voltage-step-up and voltage-step-down means and the voltage-step-down and multiplicative voltage-step-up means selected by the selecting means to receive power from the common direct current power source in different timings and to output respective voltages, and

wherein the voltage step-down means receives power from the common direct current power source with a substantially identical timing when either one of the combinations is selected.

9. (Currently Amended) A power supply method, comprising the steps of:

providing a plurality of power source circuits with a common direct current power source;

generating a ~~plurality of common~~ oscillator ~~signals~~ signal, and

performing a time sharing control based on the ~~plurality of common~~ oscillator ~~signals~~ signal to enable the plurality of power source circuits to receive power from the common direct current power source under different timings and to output respective voltages.

10. (Original) The power supply method according to claim 9,

wherein the respective voltages are different from each other.

11. (Currently Amended) The power supply method according to claim 10,
further comprising the steps of:

selecting at least two power source circuits out of the plurality of power source circuits,

wherein a controlling step performs the time sharing control based on the ~~plurality of~~ oscillator ~~signals~~ signal to enable the selected at least two power

source circuits to receive power from the common direct current power source in different timings .

12. (Currently Amended) The power supply method according to claim 11,

wherein the plurality of power source circuits include a voltage-step-up circuit, a voltage-step-down circuit, and a multiplicative voltage-step-up circuit, and wherein

the selecting step selects one of a combination of the voltage-step-up and voltage-step-down circuits, and the voltage-step-down and multiplicative voltage-step-up circuits, and wherein

the performing step performs the time sharing control based on the oscillator ~~signals~~ signal to enable one of the combination of the voltage-step-up and voltage-step-down circuits, and the voltage-step-down and multiplicative voltage-step-up circuits, selected by the selecting step. to receive power from the common direct current power source in different timings and to output respective voltages, and

wherein the voltage step-down circuit receives power from the common direct current power source with a substantially identical timing when either one of the combinations is selected.

13. (New) A power supply apparatus, comprising:

a plurality of power source circuits with a common direct current power source;

an oscillator circuit which generates a common oscillator signal; and

a controller which performs a time sharing control based on an edge of the oscillator signal to enable the plurality of power source circuits to receive power from the common direct current power source in different timings and to output respective voltages.

14. (New) The power supply apparatus according to claim 13,

wherein the respective voltages are different from each other.

15. (New) The power supply apparatus according to claim 14,
further comprising:

a selection circuit, selecting at least two power source circuits out of the
plurality of power source circuits,

wherein the controller performs the time sharing control to enable the
selected at least two power source circuits to receive power from the common
direct current power source based on the oscillator signal.

16. (New) The power supply apparatus according to claim 15,

wherein three of the plurality of power source circuits respectively
comprise a voltage-step-up circuit, a voltage-step-down circuit, and a
multiplicative voltage-step-up circuit, wherein

the selection circuit selects one of a combination of the voltage-step-up
and voltage-step-down circuits and the voltage-step-down and multiplicative
voltage-step-up circuits, and wherein

the controller performs the time sharing control based on the oscillator
signal to enable one of the combination of the voltage-step-up and voltage-step-

down circuits and the voltage-step-down and multiplicative voltage-step-up circuits selected by the selection circuit to receive power from the common direct current power source, and

wherein the voltage step-down circuit receives power from the common direct current power source with a substantially identical timing when either one of the combinations is selected.

17. (New) The power supply apparatus according to claim 16, wherein the combination of the voltage-step-up and voltage-step-down circuits is triggered on an edge of the oscillator signal when the voltage level of the edge is at a first reference value.

18. (New) The power supply apparatus according to claim 17, wherein the combination of the voltage-step-down and multiplicative voltage-step-up circuits is triggered on an edge of the oscillator signal when the voltage level of the edge is at a second reference value.

19. (New) A power supply control apparatus, comprising:

an oscillator circuit which generates a common oscillator signal;

a plurality of power source circuits with a common direct current power source, at least one of the plurality of power source circuits comprising:

an electric storage circuit;

a semiconductor switch for controlling a storage of an electric power supplied by the common direct current power source into the electric storage circuit;

an error amplifier for comparing a divided voltage obtained by dividing an output voltage and a reference voltage to output a control signal such that the divided voltage is equalized to the reference voltage; and

a controlling circuit for determining a time to start the storage of the electric power supplied by the common direct current power source into the electric storage circuit based on the control signal output by the error amplifier and the common oscillator signal generated by the common oscillator circuit,

wherein the controlling circuit determines the time to start the storage of the electric power differently from times that remaining power source circuits of the plurality of power source circuits start the storage of the electric power.